

## CLAIMS

What is claimed is:

1. An apparatus for managing data corresponding to a plurality of reticles in a semiconductor manufacturing system including a plurality of processing stages, the apparatus comprising:

a central reticle database configured and arranged to store data associated with each of the plurality of reticles;

a reticle management controller coupled to the central reticle database, the reticle management controller configured and arranged to store and retrieve data from the central reticle database;

a stocker including a stocker controller, a stocker database, and a plurality of storage locations configured and arranged to store at least one of the plurality of reticles, the stocker controller coupled to the stocker database, the stocker controller configured and arranged to store at least a portion of the plurality data corresponding to the at least one of the plurality of reticles stored within the plurality of storage locations within the stocker database; and

the reticle management controller coupled to the stocker controller, the reticle management controller configured and arranged to receive from and to provide, to the stocker controller, at least a portion of the plurality data corresponding to each of the at least one of the plurality of reticles stored within the plurality of storage locations.

2. The apparatus of claim 1 wherein the data  
corresponding to each of the plurality of reticles stored  
in the central reticle database includes a plurality of  
reticle identifying data.

3. The apparatus of claim 2 wherein the plurality of  
reticle identifying data includes:

an attribute identifying the reticle;

an attribute identifying the location of the  
reticle.

4. The apparatus of claim 3 wherein the plurality of  
reticle identifying data further includes:

an attribute identifying a reticle carrier housing  
the reticle;

an attribute identifying a the date and time the  
reticle was entered into use; and

an attribute identifying a user identifier who  
created the reticle.

5. The apparatus of claim 1 wherein the data  
corresponding to each of the plurality of reticles stored  
in the central reticle database includes a plurality of  
reticle history data.

6. The apparatus of claim 1 wherein the data  
corresponding to each of the plurality of reticles stored

in the central reticle database includes a plurality of  
reticle history data includes:

an attribute identifying the number of times the  
reticle has been retrieved;

5 an attribute identifying the date the reticle was  
last retrieved;

an attribute identifying the number of times the  
reticle has been stored; and

10 an attribute identifying the date the reticle was  
last stored.

7. The apparatus of claim 1 wherein the data  
corresponding to each of the plurality of reticles stored  
in the central reticle database includes a plurality of  
15 reticle history data further includes:

an attribute identifying a user identifier who last  
selected the reticle; and

20 an attribute identifying a user identifier who last  
stored the reticle.

8. The apparatus of claim 1 wherein the data  
corresponding to each of the plurality of reticles stored  
in the central reticle database includes a plurality of  
reticle maintenance data.

25 9. The apparatus of claim 8 wherein the data  
corresponding to each of the plurality of reticles stored  
in the central reticle database includes a plurality of  
reticle maintenance data includes:

an attribute identifying the number of times the reticle has been cleaned;

an attribute identifying the date on which the reticle was last cleaned;

5 an attribute identifying the number of times the reticle was inspected; and

an attribute identifying the date on which the reticle was last inspected;

10 10. The apparatus of claim 9 wherein the plurality of reticle maintenance data further includes:

an attribute identifying a user identifier who last cleaned the reticle;

15 an attribute identifying a location where the reticle was last cleaned;

an attribute identifying a user identifier who last inspected the reticle; and

an attribute identifying a location where the reticle was last inspected.

20

11. The apparatus of claim 1 further including:

a central system database configured and arranged to store data corresponding to the system requirements of the plurality of reticles; and

25 the reticle management controller coupled to the central system database, the reticle management controller configured and arranged to store and retrieve system data from the central system database.

12. The apparatus of claim 11 wherein the data corresponding to the system requirements of the plurality of reticles includes:

5 an attribute identifying the maximum number of cleanings of a reticle;

an attribute identifying the maximum number of inspections of a reticle;

an attribute identifying the maximum number of uses of a reticle between inspections; and

10 an attribute identifying the maximum number of uses of a reticle between cleaning.

13. The apparatus of claim 11 wherein the data corresponding to the system requirements of the plurality of reticles includes:

15 an attribute identifying the maximum time between inspections of a bare reticle; and

an attribute identifying the maximum time between cleanings of a bare reticle.

20

14. The apparatus of claim 11 wherein the data corresponding to the system requirements of the plurality of reticles includes:

25 an attribute identifying the maximum time between inspections of a kitted reticle; and

an attribute identifying the maximum time between cleanings of a kitted reticle.

15. The apparatus of claim 1 further including a plurality of stockers, each of the plurality of stockers including a stocker controller, a stocker database, and a plurality of storage locations configured and arranged to store at least one of the plurality of reticles, the stocker controller configured and arranged to collect at least a portion of the plurality data corresponding to each of the at least one of the plurality of reticles stored within the plurality of storage locations and to store the at least a portion of data within the stocker database; and

the reticle management controller coupled to each of the plurality of stocker controllers, the reticle management controller configured and arranged to receive from each of the plurality of stocker controllers and to provide to each of the plurality of stocker controllers, at least a portion of the plurality data corresponding to each of the at least one of the plurality of reticles stored within the plurality of storage locations corresponding to each of the plurality of stockers.

16. An apparatus for managing a plurality of reticles in a semiconductor manufacturing system including a plurality of processing stages, the apparatus comprising:

a central reticle database configured and arranged to store data corresponding to each of the plurality of reticles;

a reticle management controller coupled to the central reticle database, the reticle management

controller configured and arranged to store and retrieve data from the central database;

5 a stocker unit including a stocker controller, a stocker database, and a plurality of storage locations configured and arranged to store at least one of the plurality of reticles, the stocker controller configured and arranged to collect at least a portion of the plurality data corresponding to each of the at least one of the plurality of reticles stored within the plurality of storage locations and to store the at least a portion of data within the stocker database;

10 the reticle management controller coupled to the stocker controller, the reticle management controller configured and arranged to receive from and to provide to at least a portion of the plurality data corresponding to each of the at least one of the plurality of reticles stored within the plurality of storage locations;

15 a reticle moving system configured and arranged to load a reticle at the stocker and deliver the reticle to a destination; and

20 the reticle management controller coupled to the reticle moving system, the reticle management controller configured and arranged to provide one or more move commands to the reticle move system, the reticle move system configured and arranged to receive the one or more move commands and operative to execute the one or more move commands.

17. The apparatus of claim 16 wherein the stocker unit is a first stocker unit, and wherein move command includes a command to store the reticle at a second stocker unit.

5

18. The apparatus of claim 16 wherein the move command includes a command to retrieve the reticle from a second stocker unit.

10 19. The apparatus of claim 16 wherein the move command includes a command to retrieve the reticle from a second stocker unit, move the reticle to the first stocker unit, and to store the reticle at the first stocker unit.

15 20. An apparatus for managing data corresponding to a plurality of reticles in a semiconductor manufacturing system including a plurality of processing stages, the apparatus comprising:

20 a central reticle database configured and arranged to store data associated with each of the plurality of reticles; and

25 a reticle management controller coupled to the central reticle database, the reticle management controller configured and arranged to store and retrieve data from the central reticle database.

21. The apparatus of claim 20 wherein the data corresponding to each of the plurality of reticles stored



in the central reticle database includes a plurality of reticle identifying data.

22. The apparatus of claim 21 wherein the plurality of  
5 reticle identifying data includes:

an attribute identifying the reticle; and  
an attribute identifying the location of the  
reticle.

10 23. The apparatus of claim 22 wherein the plurality of  
reticle identifying data further includes:

an attribute identifying a reticle carrier housing  
the reticle;  
an attribute identifying a the date and time the  
15 reticle was entered into use; and  
an attribute identifying a user identifier who  
created the reticle.

20 24. The apparatus of claim 20 wherein the data  
corresponding to each of the plurality of reticles stored  
in the central reticle database includes a plurality of  
reticle history data.

25 25. The apparatus of claim 20 wherein the data  
corresponding to each of the plurality of reticles stored  
in the central reticle database includes a plurality of  
reticle history data includes:

an attribute identifying the number of times the  
reticle has been retrieved;

an attribute identifying the date the reticle was last retrieved;

an attribute identifying the number of times the reticle has been stored; and

5 an attribute identifying the date the reticle was last stored.

26. The apparatus of claim 20 wherein the data corresponding to each of the plurality of reticles stored in the central reticle database includes a plurality of reticle history data further includes:

an attribute identifying a user identifier who last selected the reticle; and

15 an attribute identifying a user identifier who last stored the reticle.

27. The apparatus of claim 20 wherein the data corresponding to each of the plurality of reticles stored in the central reticle database includes a plurality of reticle maintenance data.

28. The apparatus of claim 27 wherein the data corresponding to each of the plurality of reticles stored in the central reticle database includes a plurality of reticle maintenance data includes:

an attribute identifying the number of times the reticle has been cleaned;

an attribute identifying the date on which the reticle was last cleaned;

an attribute identifying the number of times the reticle was inspected; and

an attribute identifying the date on which the reticle was last inspected;

5

29. The apparatus of claim 28 wherein the plurality of reticle maintenance data further includes:

an attribute identifying a user identifier who last cleaned the reticle;

10

an attribute identifying a location where the reticle was last cleaned;

an attribute identifying a user identifier who last inspected the reticle; and

15

an attribute identifying a location where the reticle was last inspected.

30. The apparatus of claim 20 further including:

20

a central system database configured and arranged to store data corresponding to the system requirements of the plurality of reticles; and

the reticle management controller coupled to the central system database, the reticle management controller configured and arranged to store and retrieve system data from the central system database.

25

31. The apparatus of claim 30 wherein the data corresponding to the system requirements of the plurality of reticles includes:

an attribute identifying the maximum number of cleanings of a reticle;

an attribute identifying the maximum number of inspections of a reticle;

5 an attribute identifying the maximum number of uses of a reticle between inspections; and

an attribute identifying the maximum number of uses of a reticle between cleaning.

10 32. The apparatus of claim 30 wherein the data corresponding to the system requirements of the plurality of reticles includes:

an attribute identifying the maximum time between inspections of a bare reticle; and

15 an attribute identifying the maximum time between cleanings of a bare reticle.

20 33. The apparatus of claim 30 wherein the data corresponding to the system requirements of the plurality of reticles includes:

an attribute identifying the maximum time between inspections of a kitted reticle; and

an attribute identifying the maximum time between cleanings of a kitted reticle.

25